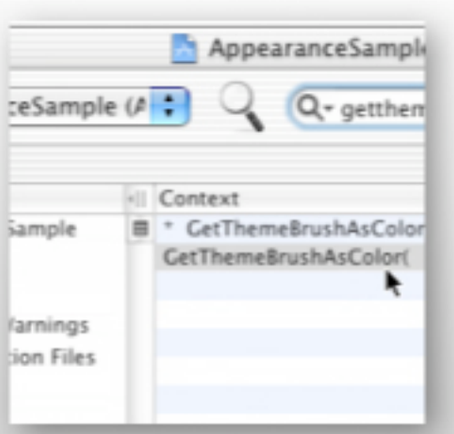
Introduction to Xcode

Session 302

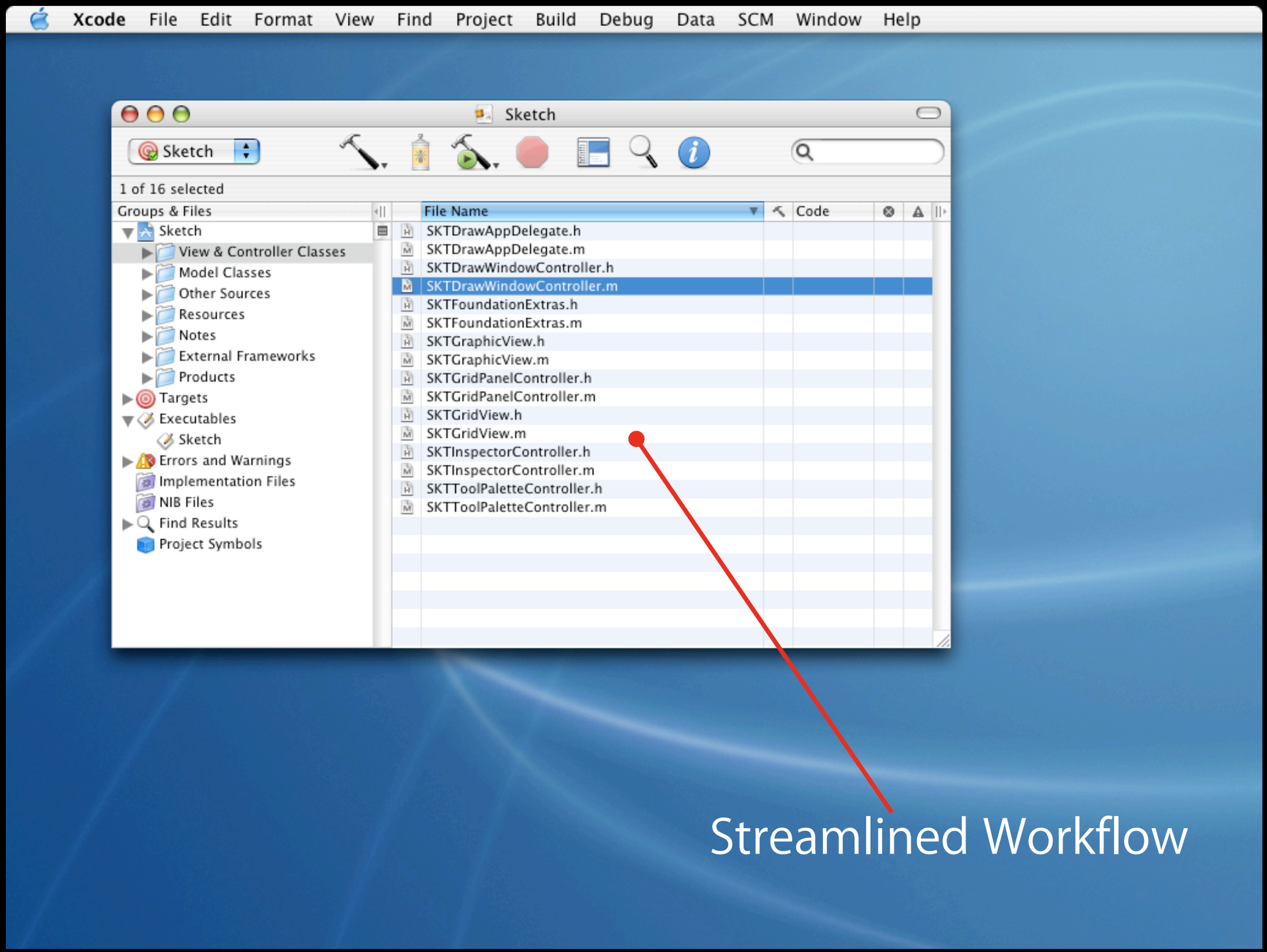


Introduction to Xcode

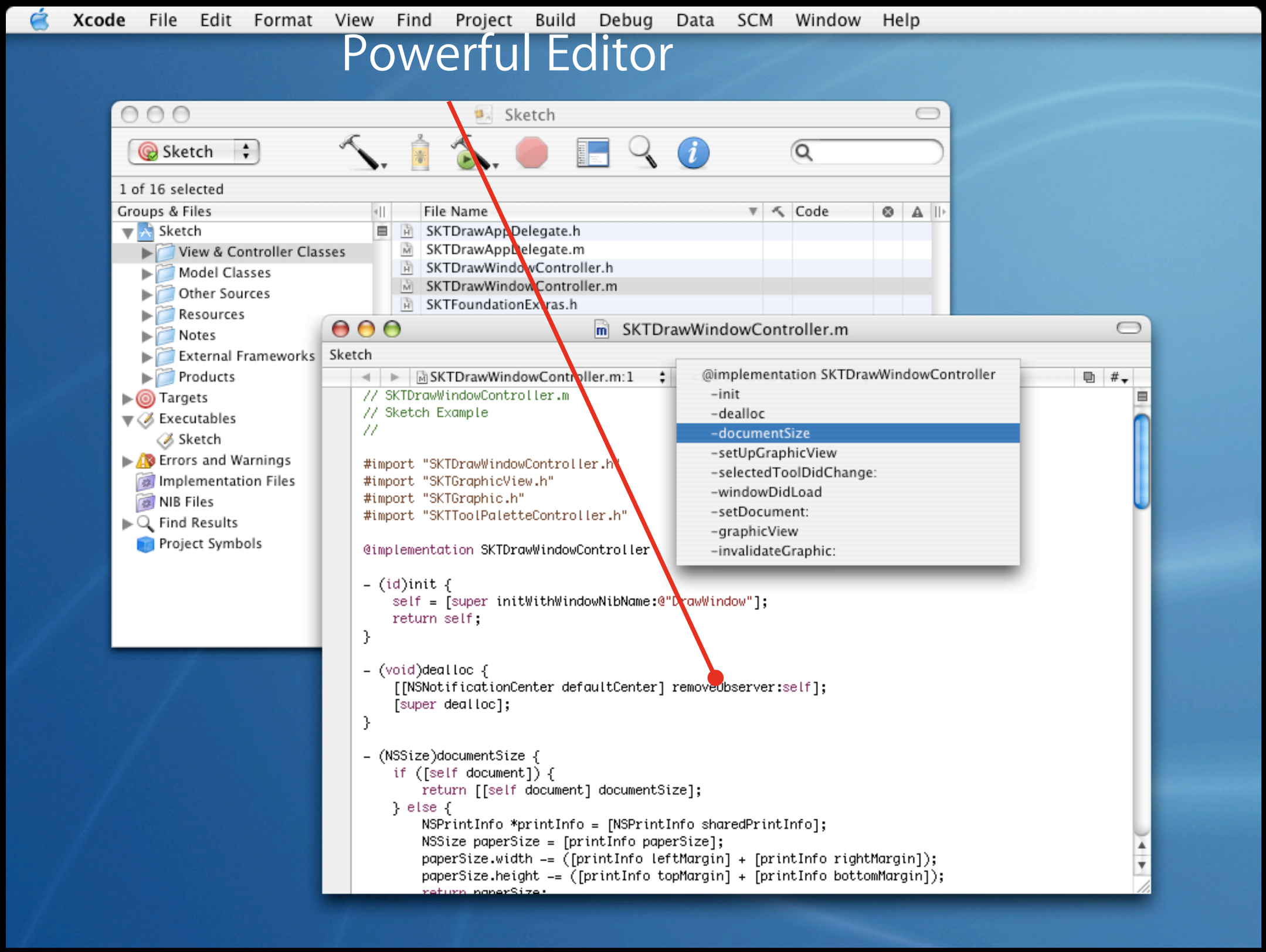
Stan Jirman
Head Coach, Xcode

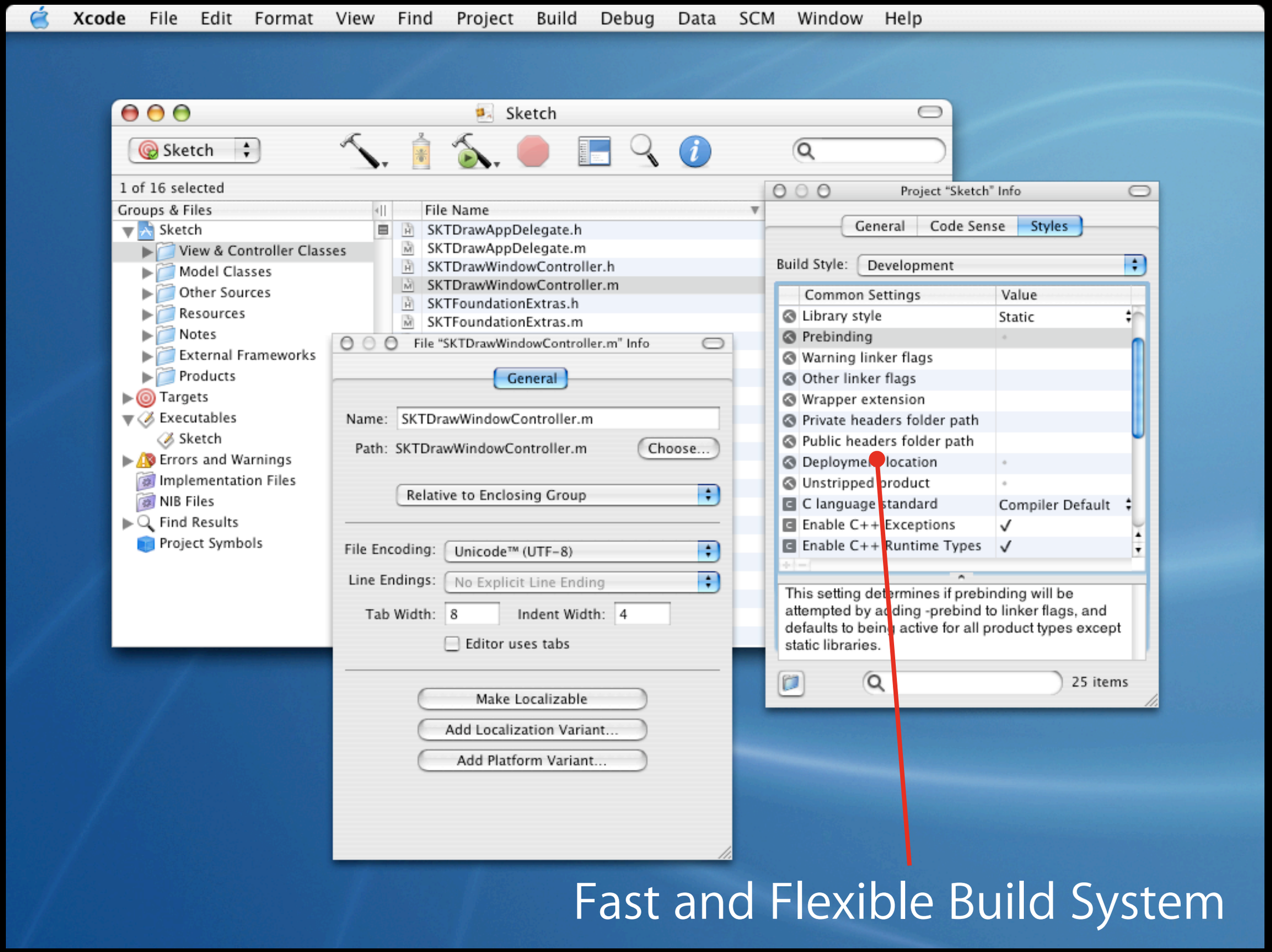
What It Takes to Be a Modern IDE

- Streamlined workflow
- Powerful editor
- Fast and flexible build system
- Quick documentation access
- Integrated with UI / profiling tools
- Source Control Management
- API-awareness in debugger


Xcode File Edit Format View Find Project Build Debug Data SCM Window Help
Sketch
Sketch
1 of 16 selected
Groups & Files
File Name
Code
Sketch
View & Controller Classes
Model Classes
Other Sources
Resources
Notes
External Frameworks
Products
Targets
Executables
Sketch
Errors and Warnings
Implementation Files
NIB Files
Find Results
Project Symbols
SKTDrawAppDelegate.h
SKTDrawAppDelegate.m
SKTDrawWindowController.h
SKTDrawWindowController.m
SKTFoundationExtras.h
SKTFoundationExtras.m
SKTGraphicView.h
SKTGraphicView.m
SKTGridPanelController.h
SKTGridPanelController.m
SKTGridView.h
SKTGridView.m
SKTInspectorController.h
SKTInspectorController.m
SKTToolPaletteController.h
SKTToolPaletteController.m
Streamlined Workflow

Powerful Editor

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SKTDrawAppDelegate.h
SKTDrawAppDelegate.m
SKTDrawWindowController.h
SKTDrawWindowController.m
SKTFoundationExtras.h
SKTFoundationExtras.m
File "SKTDrawWindowController.m" Info
General
Name: SKTDrawWindowController.m
Path: SKTDrawWindowController.m
Choose...
Relative to Enclosing Group
File Encoding: Unicode™ (UTF-8)
Line Endings: No Explicit Line Ending
Tab Width: 8
Indent Width: 4
Editor uses tabs
Make Localizable
Add Localization Variant...
Add Platform Variant...
Project "Sketch" Info
General
Code Sense
Styles
Build Style: Development
Common Settings
Value
Library style
Static
Prebinding
Warning linker flags
Other linker flags
Wrapper extension
Private headers folder path
Public headers folder path
Deployment location
Unstripped product
C language standard
Compiler Default
Enable C++ Exceptions
Enable C++ Runtime Types
This setting determines if prebinding will be attempted by adding -prebind to linker flags, and defaults to being active for all product types except static libraries.
25 items
Fast and Flexible Build System

Xcode File Edit Format View Find Project Build Debug Data SCM Window Help

Xcode Help ⌘?
Show Documentation Window
Search Help for Selected Text
Show Release Notes
Show Older Release Notes
Show Expert Preferences Notes
Open man page...

Developer Documentation

Print
API Search
API Search

Groups
Library
AppleScript
Carbon
Cocoa
Darwin
Drivers
Graphics
Java
QuickTime
Tools

Cocoa Documentation Topics

ADC Home > Documentation >

Cocoa Documentation Topics

Display Documents for All Cocoa Topics.

Cocoa is an object-oriented application environment designed specifically for developing Mac OS X-only native applications. The Cocoa frameworks support rapid development and high productivity, and include a full-featured set of classes designed to create robust and powerful Mac OS X applications. Cocoa provides developers starting new Mac OS X-only projects the fastest way to full-featured, extensible, and maintainable implementations. Applications from UNIX and other OS platforms can also be brought to Mac OS X quickly by using Cocoa to build state-of-the-art Aqua user interfaces while retaining most existing core code.

Cocoa Fundamentals
AppleScript Studio Essentials
Cocoa Core Concepts
Developing Cocoa Java Applications: A Tutorial
Developing Cocoa Objective-C Applications: A Tutorial
Integrating Carbon and Cocoa in Your Application
System Overview
The Objective-C Programming Language
What is Cocoa?

Cocoa API Reference
Application Kit Reference for Java
Application Kit Reference for Objective-C
Disc Recording Objective-C Programming Interface
Foundation Reference for Java
Foundation Reference for Objective-C
Preference Pane Reference for Objective-C
Screen Saver Reference for Objective-C

Cocoa Topics

Accessibility
Programming interfaces that support assistive technology applications, which help make the Macintosh accessible to all users.

AppleScript
The Mac OS X-native scripting technology that allows users to directly control applications, and allows developers to make their applications scriptable.

Data Management
Support for locating, loading, and using various data available to a program.

Events & Other Input
How programs become notified of and respond to various events

File Management
Programming interfaces for gaining access to files and folders

Graphics & Imaging
Programming interfaces that support the optimized display of

Quick Documentation Access

Interface Builder File Edit Classes Format Layout Tools Window Help

Sketch

Sketch

1 of 5 selected

Groups & Files

- Sketch
  - View & Controller Classes
  - Model Classes
  - Other Sources
  - Resources
  - Notes
  - External Frameworks
  - Products
- Targets
- Executables
  - Sketch
- Errors and Warnings
- Implementation Files
- NIB Files
- Find Results
- Project Symbols

File Name

- Draw2.nib
- DrawWindow.nib
- GridPanel.nib
- Inspector.nib
- ToolPalette.nib

Cocoa-Menus

Application
File
Edit
Window
Find
Font

Text
Submenu
Item
Format

Grid Settings

SKTGridView

Spacing

Show Grid
Snap to Grid

Color:

Grid nel.nib

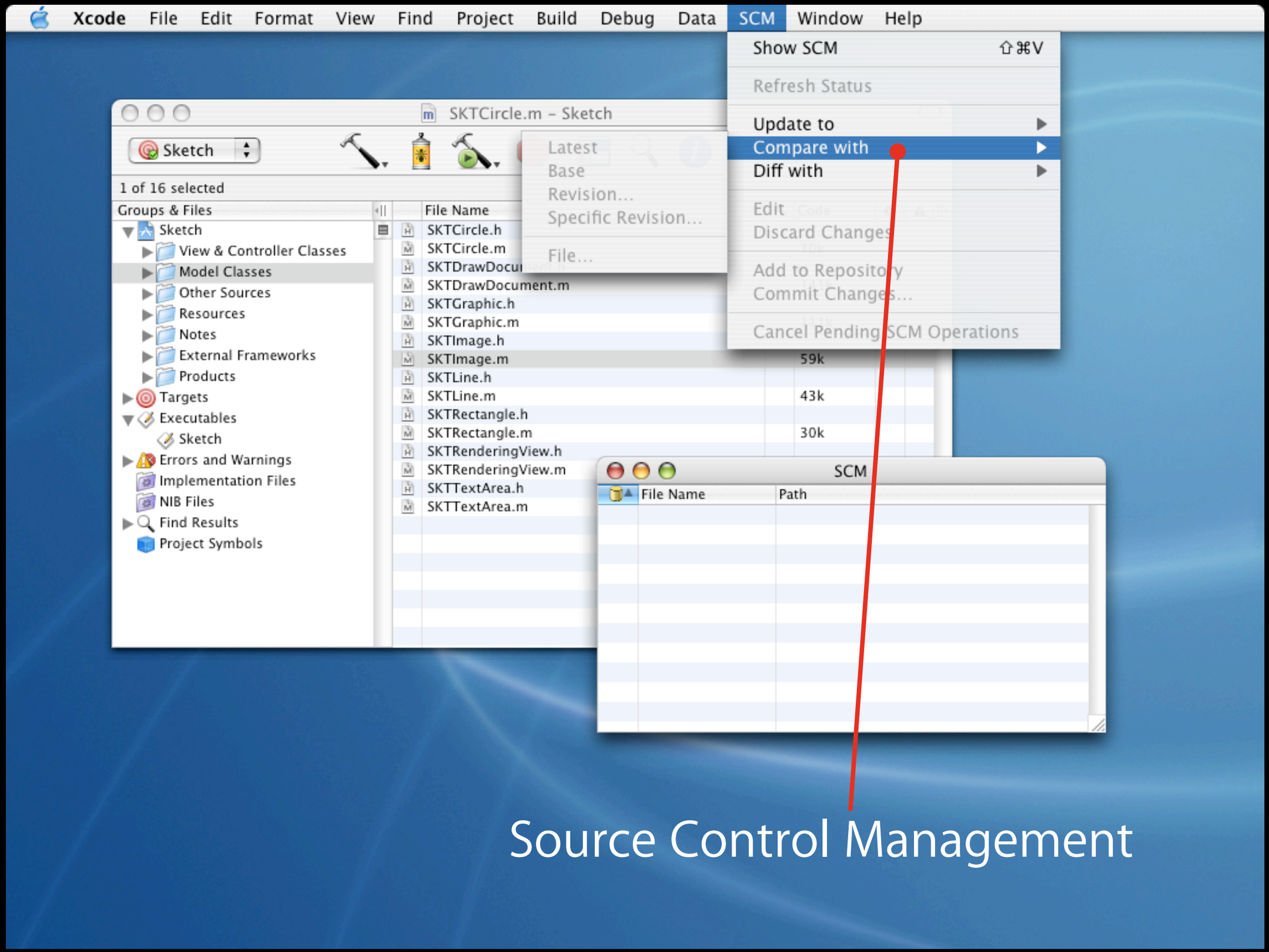
Instances | Classes | Images | Sounds | Nib

File's Owner

First Responder

Panel

Integrated With UI / Profiling Tools


Xcode File Edit Format View Find Project Build Debug Data SCM Window Help
Show SCM ⇧⌘V
Refresh Status
Update to
Compare with
Diff with
Edit
Discard Changes
Add to Repository
Commit Changes...
Cancel Pending SCM Operations
Latest
Base
Revision...
Specific Revision...
File...
SKTCircle.m – Sketch
Sketch
1 of 16 selected
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SKTCircle.h
SKTCircle.m
SKTDrawDocument.m
SKTGraphic.h
SKTGraphic.m
SKTImage.h
SKTImage.m
59k
SKTLine.h
SKTLine.m
43k
SKTRectangle.h
SKTRectangle.m
30k
SKTRenderingView.h
SKTRenderingView.m
SKTTextArea.h
SKTTextArea.m
SCM
File Name
Path
Source Control Management

Xcode File Edit Format View Find Project Build Debug Data SCM Window Help

SKTCircle.m – Sketch

Sketch

1 of 16 selected – Int

Groups & Files

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- Implementation
- NIB Files
- Find Results
- Project Symbols

Debug – Sketch (Sketch)

Terminate Restart Pause Continue Step Over Step Into Step Out Fix Breakpoints Console Drawer

GDB: Interrupted.

#	Thread-1
3	CFRunLoopRunSpecific
4	RunCurrentEventLoopInMode
5	ReceiveNextEventCommon
6	BlockUntilNextEventMatchingListInMode
7	_DPSNextEvent
8	-[NSApplication nextEventMatchingMask:untilDate:
9	-[NSApplication run]
10	NSApplicationMain
11	main

Variable	Value	Summary
▼Arguments		
argc	1	
▶argv		out of scope

Sketch_main.m:8 main()

```
// Sketch_main.m
// Sketch Example
//

#import <AppKit/AppKit.h>

int main(int argc, const char *argv[]) {
    return NSApplicationMain(argc, argv);
}

/*
 IMPORTANT:  This Apple software is supplied to you by Apple Computer, Inc. ("Apple") in
 consideration of your agreement to the following terms, and your use, installation,
 modification or redistribution of this Apple software constitutes acceptance of these
 terms.  If you do not agree with these terms, please do not use, install, modify or
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 In consideration of your agreement to abide by the following terms, and subject to these
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 this original Apple software (the "Apple Software"), to use, reproduce, modify and
 redistribute the Apple Software, with or without modifications, in source and/or binary
 forms; provided that if you redistribute the Apple Software in its entirety and without
 modifications, you must retain this notice and the following text and disclaimers in all
```

API-Awareness in Debugger

It Gets Even Better…

- Zero Link
- Fix and Continue
- Annotated source editor
- Code Sense
- Parallel and distributed builds
- Predictive compilation

It Gets Even Better…

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Let’s Have a Closer Look…

The Project Window

- Static and dynamic groups
- Searching and filtering
- Optional integrated editor
- Inspectors with search field

Xcode Editor

- Apply fixes to running code
- Code Sense
- Errors shown in source code
- Quick access to documentation
- Customizable key bindings

Code Sense

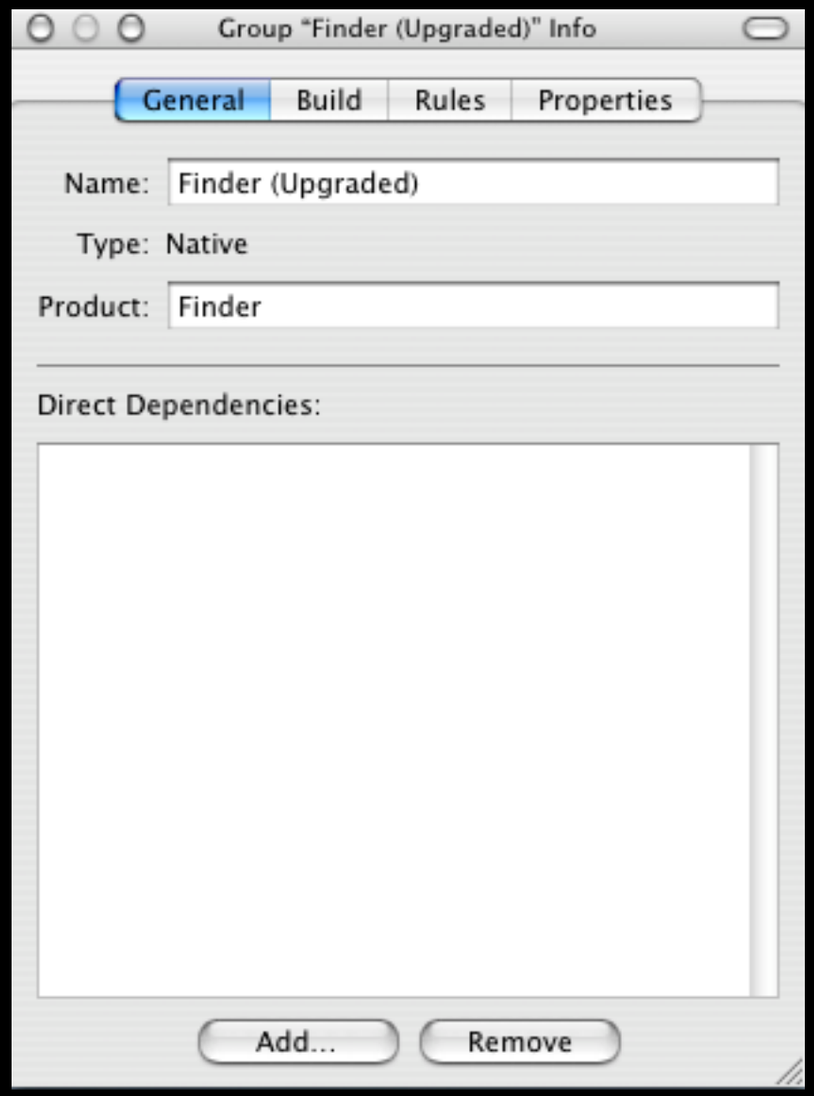
- Xcode stays aware of your code
  - Context-sensitive code completion
  - Class browsing
  - More coming
- Works for uncompiled “code in progress”
- Works for C, C++, and Objective-C
  - Will work for Java in Panther

Xcode Inspectors

- Consistent interface

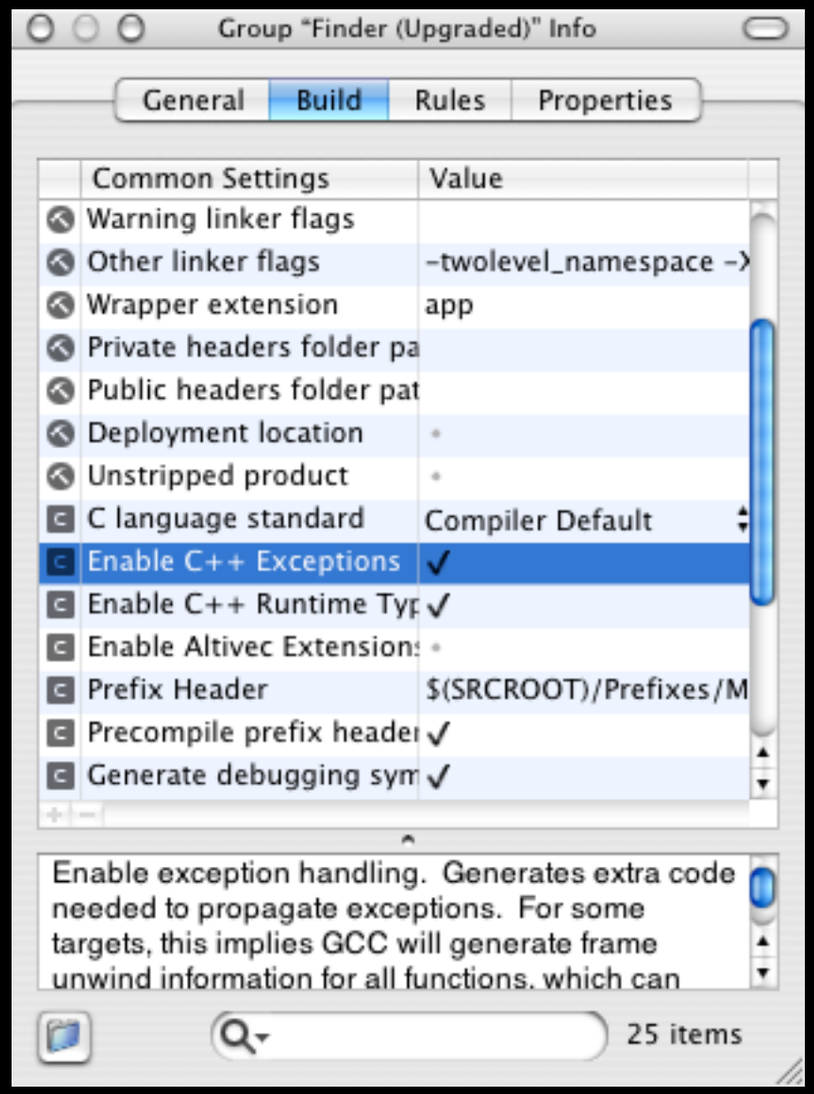
Xcode Inspectors

- Consistent interface
- Target dependencies



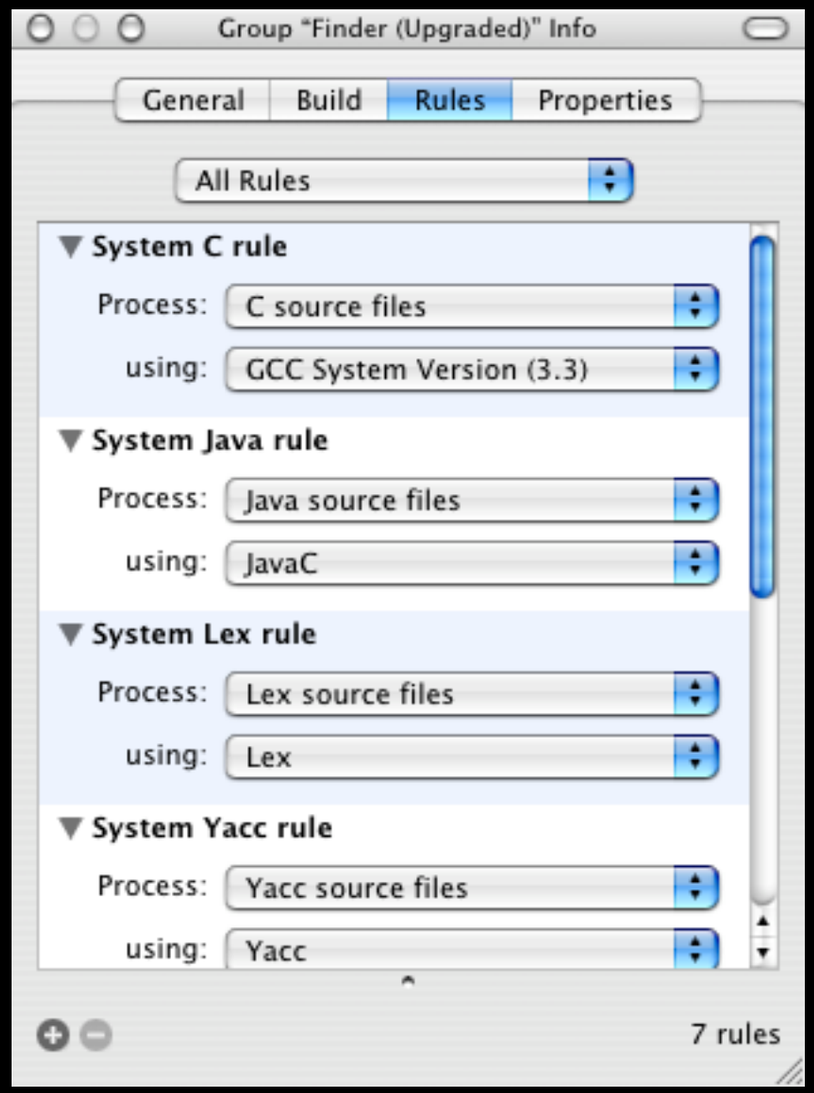
Xcode Inspectors

- Consistent interface
- Target dependencies
- Compiler options



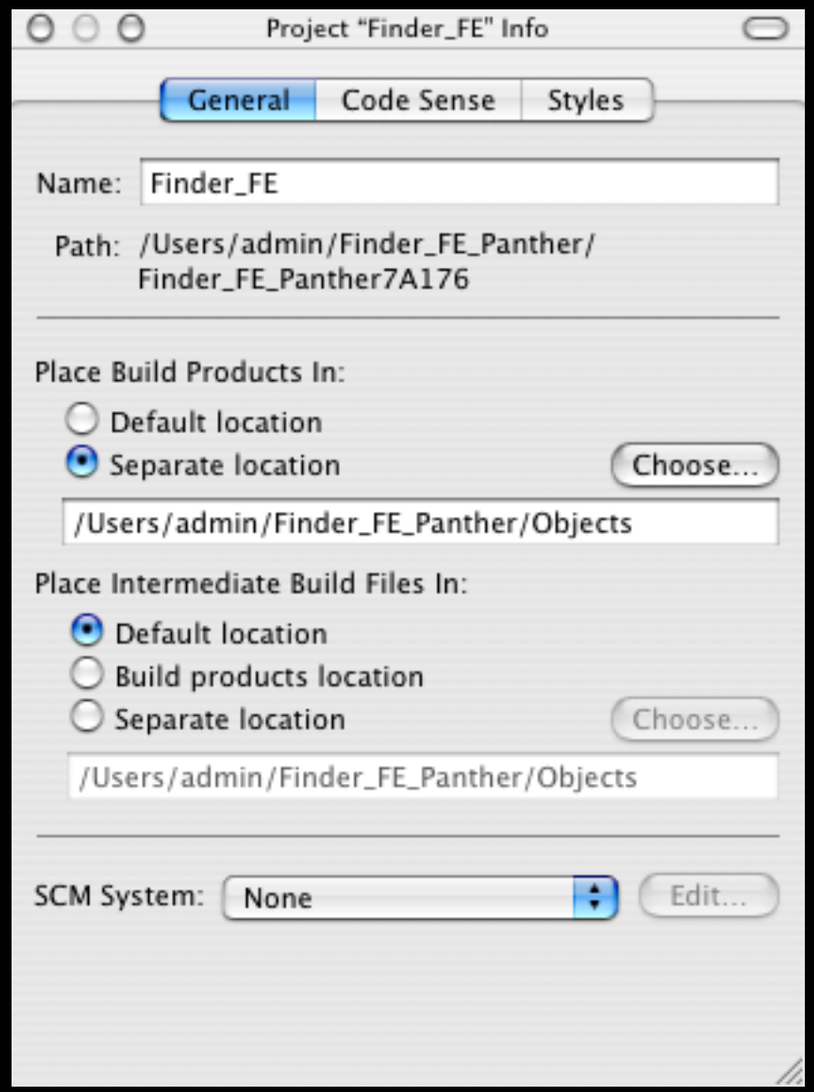
Xcode Inspectors

- Consistent interface
- Target dependencies
- Compiler options
- Build rules



Xcode Inspectors

- Consistent interface
- Target dependencies
- Compiler options
- Build rules
- Project settings



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- Target dependencies
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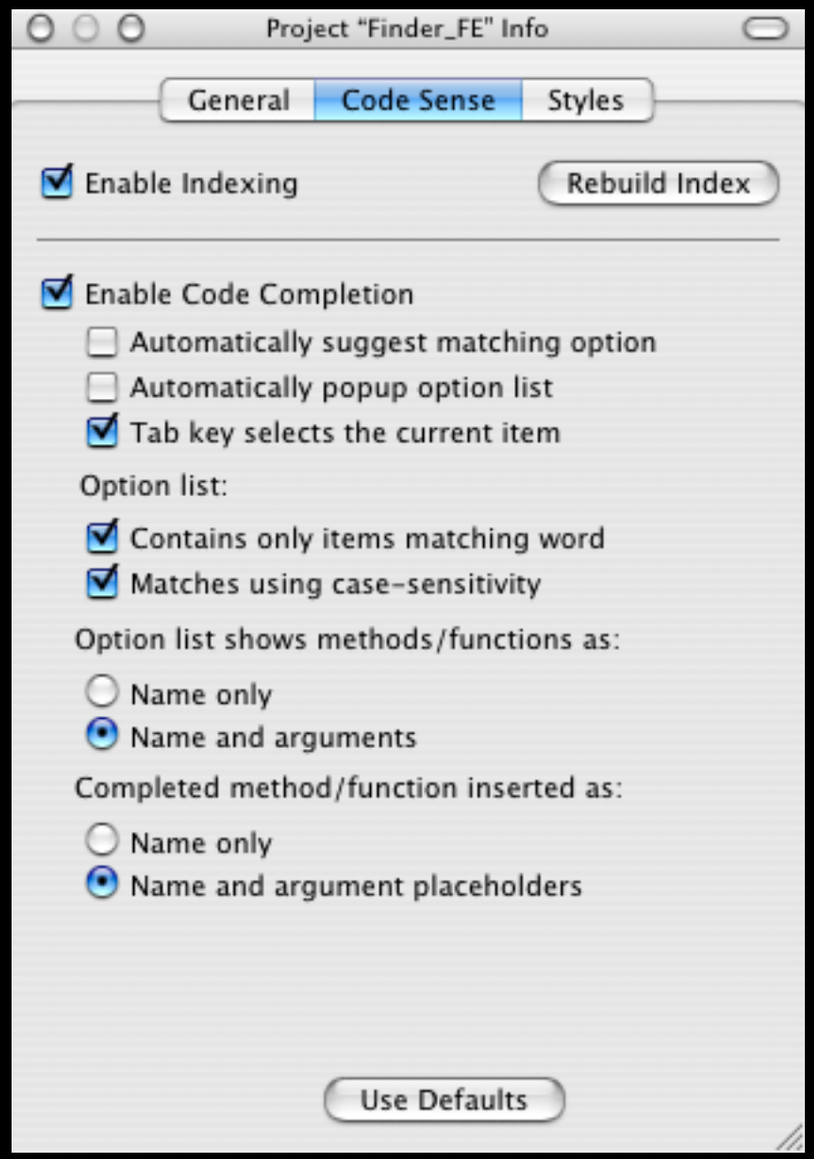
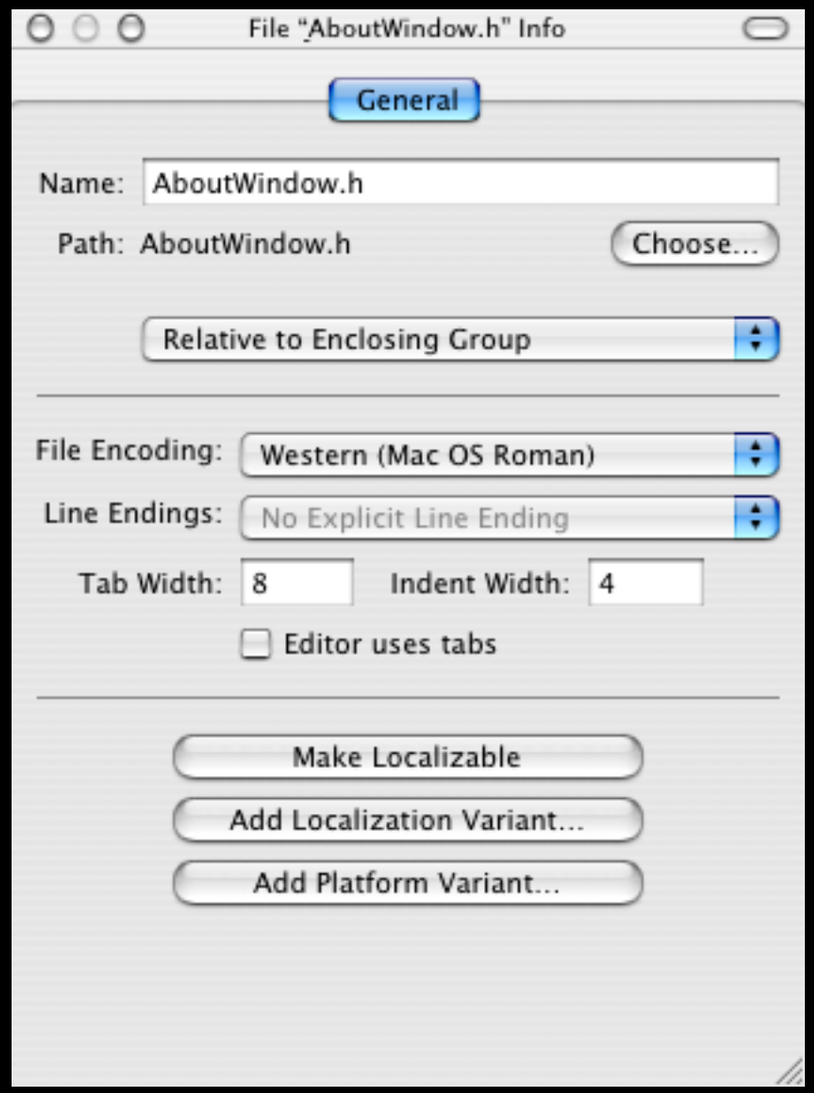


Xcode Inspectors

- Consistent interface
- Target dependencies
- Compiler options
- Build rules
- Project settings
- Code Sense
- Source code settings



Demo

Xcode Workflow

Matthew Firlik
Senior Xcode Engineer

http://developer.apple.com/wwdc2003/urls.html

Xcode Build System

- Integrated into IDE
- Fast dependency analysis
- Feedback in the interface
  - Up-to-date status
  - Error annotation
  - Optional access to details

Xcode's Compiler

- Based on gcc 3.3
- Fast compile time
- Generates efficient code
- PCH precompiled headers
- Support for CodeWarrior-style inline asm

Precompiled Headers in gcc

- New PCH mechanism in gcc 3.3
- Works great with C++
- More coming in Panther

Predictive Compilation

- "Primes the pump"
  - Most compiles are "syntax checks" of new code
- Starts the compiler before you click "Build"
  - 99% of compiler input is framework headers
  - Once you start a build, all it has to do is the last 1%

Distributed Builds

- Takes advantage of Rendezvous
- Creates and dispatches self-contained compile jobs
- Precomps and linking happen on your machine
- Benefits are greatest at ~4 machines
  - 100Mbps or faster network required

Demo

Xcode Build System

Anders Bertelrud
Lead Xcode Engineer

http://developer.apple.com/wwdc2003/urls.html

Xcode Debugger

- Efficient edit-debug cycle
- Context-sensitive data display
  - Data view summaries
  - Customizable formatters
- Break on C++ exceptions

Zero Link

- Typical debug cycle changes only a few files
- Linking is time consuming
  - Let’s just do away with it!
- Dynamically load object files on-demand

Fix and Continue

- Dynamically modify your running app
- Logic bugs
  - Wrong loop variable
  - Infinite loops
- Trial and error code
  - UI layout
  - Coordinate transforms

Fix and Continue

- Make changes within functions
- Change constants
- Add / remove / modify local variables
- Add functions and call them

Fix and Continue Caveats

- Can’t change anything that has global effect
  - Headers
  - Globals
  - Most call signatures
- See dedicated debugger session

Performance Tool Integration

- Integration with performance tools
  - Sampler
  - MallocDebug
  - ObjectAlloc
  - Thread Viewer
- See dedicated performance tool session 305

Demo

Xcode Debugging

Christopher Friesen
Senior Xcode Engineer

http://developer.apple.com/wwdc2003/urls.html

Other Features

- Source Trees
- SDK support
- Perforce integration
- Xcode is AppleScriptable
- Documentation access

Interface Builder

Eric Seymour
Lead Engineer, Interface Builder

What Is Interface Builder (IB)

- Builds Aqua compliant user interfaces
- Supports Carbon and Cocoa
- Works with Xcode!

Interface Builder File Edit Classes Format Layout Tools Window Help Wed 10:22 AM

Window

Cities
Cupertino
San Jose
Santa Clara
San Francisco
Palo Alto
San Carlos
Los Gatos
Sunnyvale

Cocoa-Menus

Application
File
Edit
Window
Find
Font
Text
Submenu
Item
Format

NSSearchField Info

Attributes

Title:
Placeholder:
Text Color:
Max Recents: Default (0 to 254)
Tag: 0
Auto Save Name:
Alignment:
Size: Regular

Enabled
Sends whole search string
Hidden

CitySearch – MainMenu

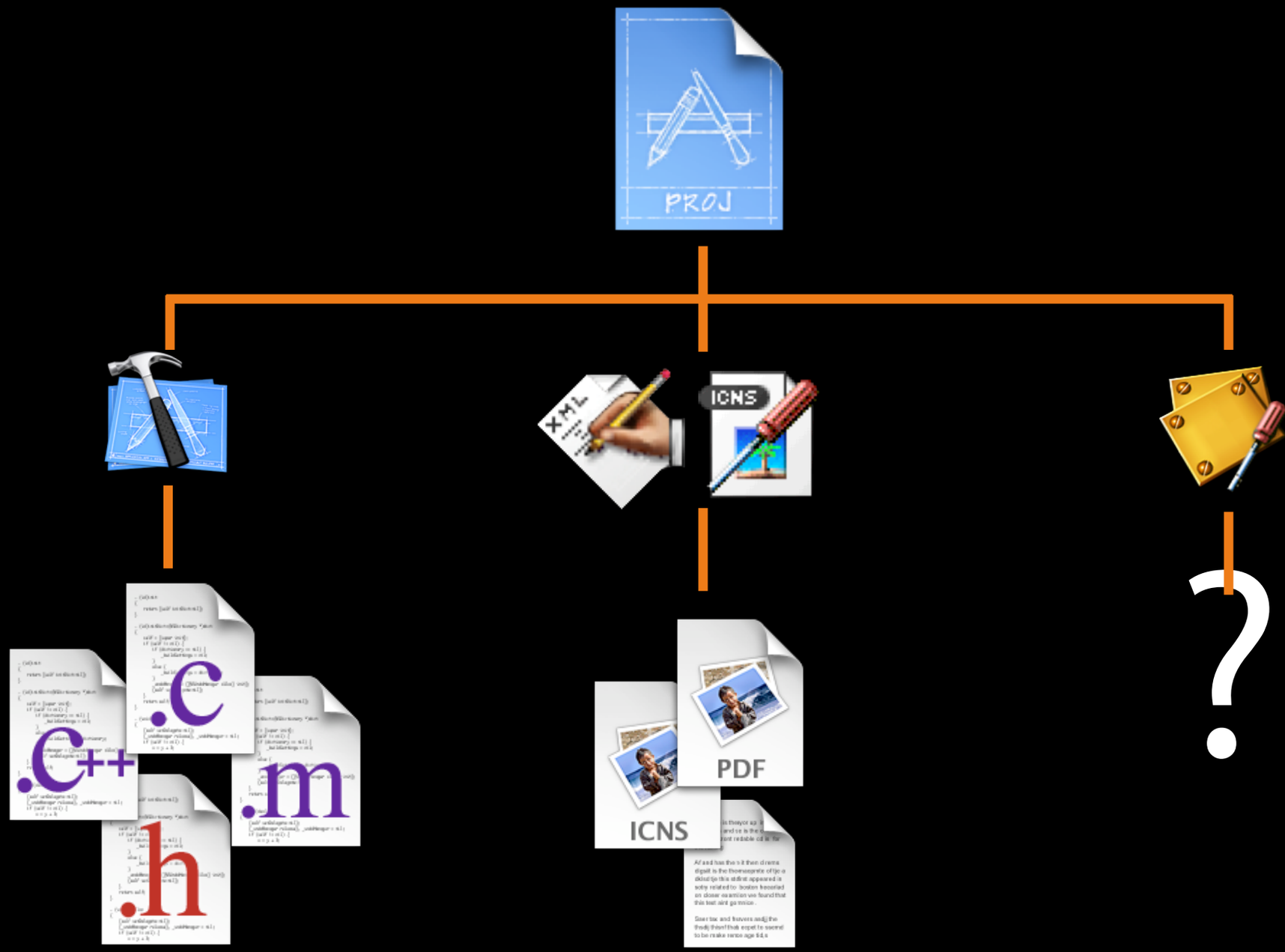
NewApplication File Edit Window Help

CitySearch

Instances Classes Images Sounds Nib

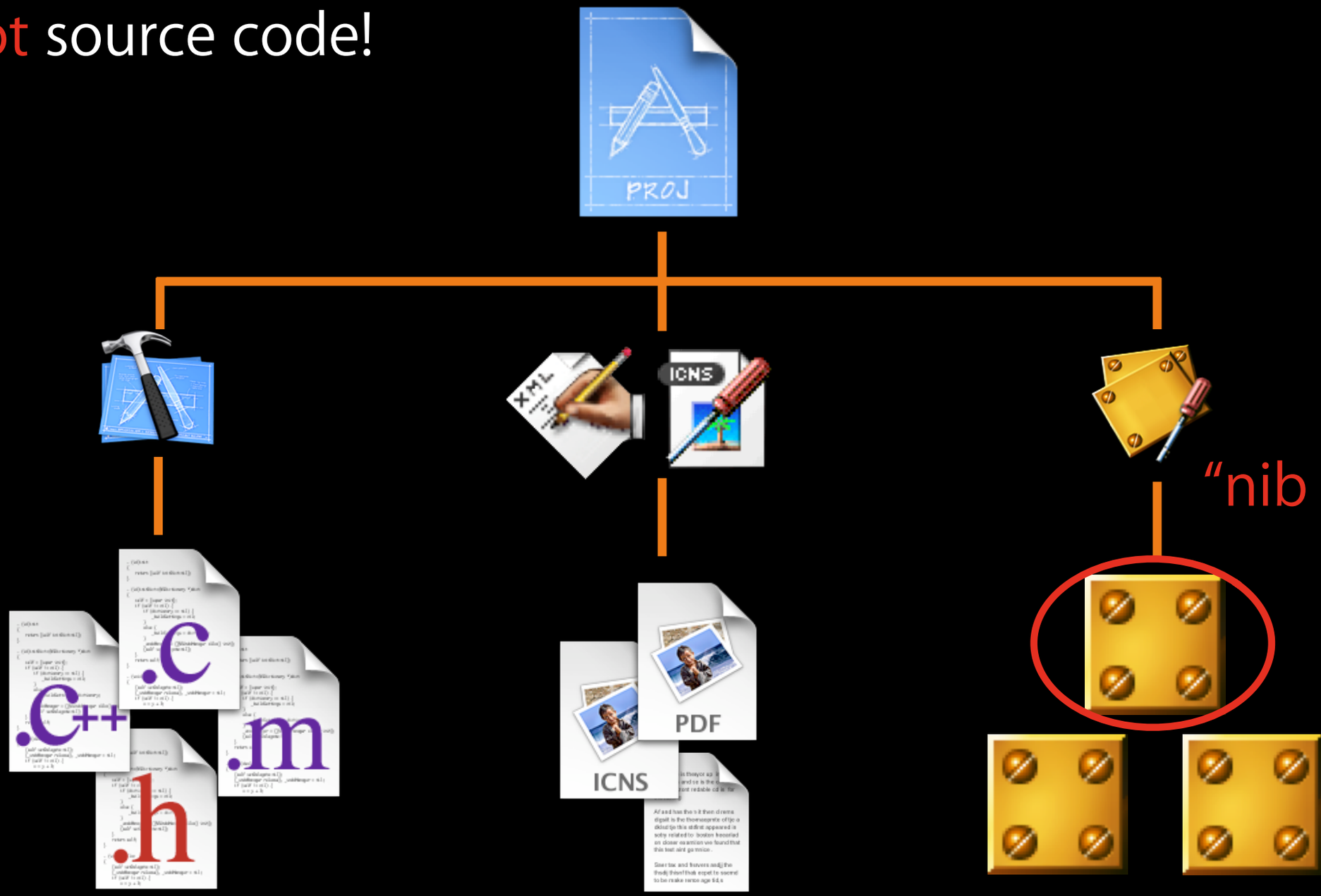
File's Owner
First Responder
MainMenu
Window
SearchCenter

Where Does Interface Builder Fit?



Where Does Interface Builder Fit?

- Saves archived objects
- Not source code!

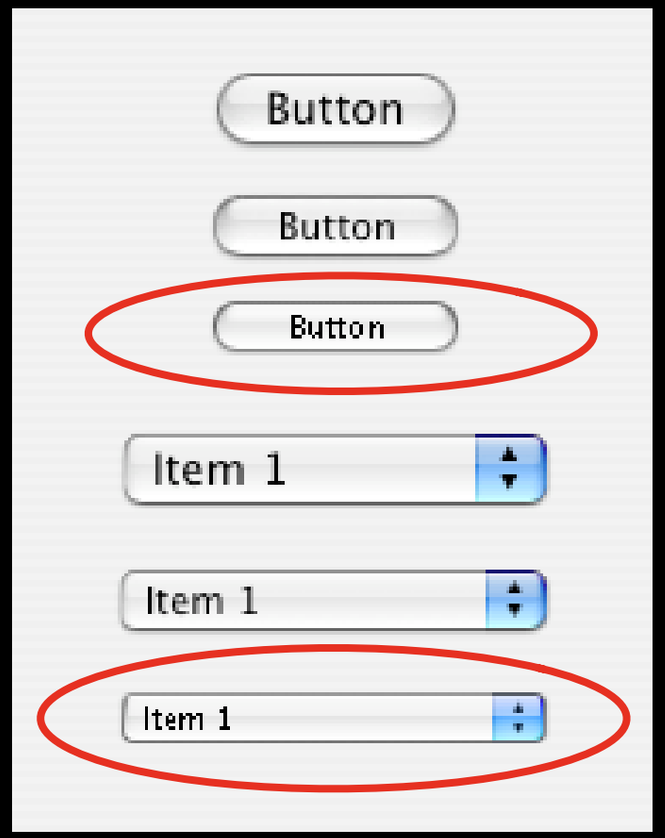


New for Carbon

- New supported Controls
  - HIImageView
  - HISearchField
  - HIScrollView
  - HITextView

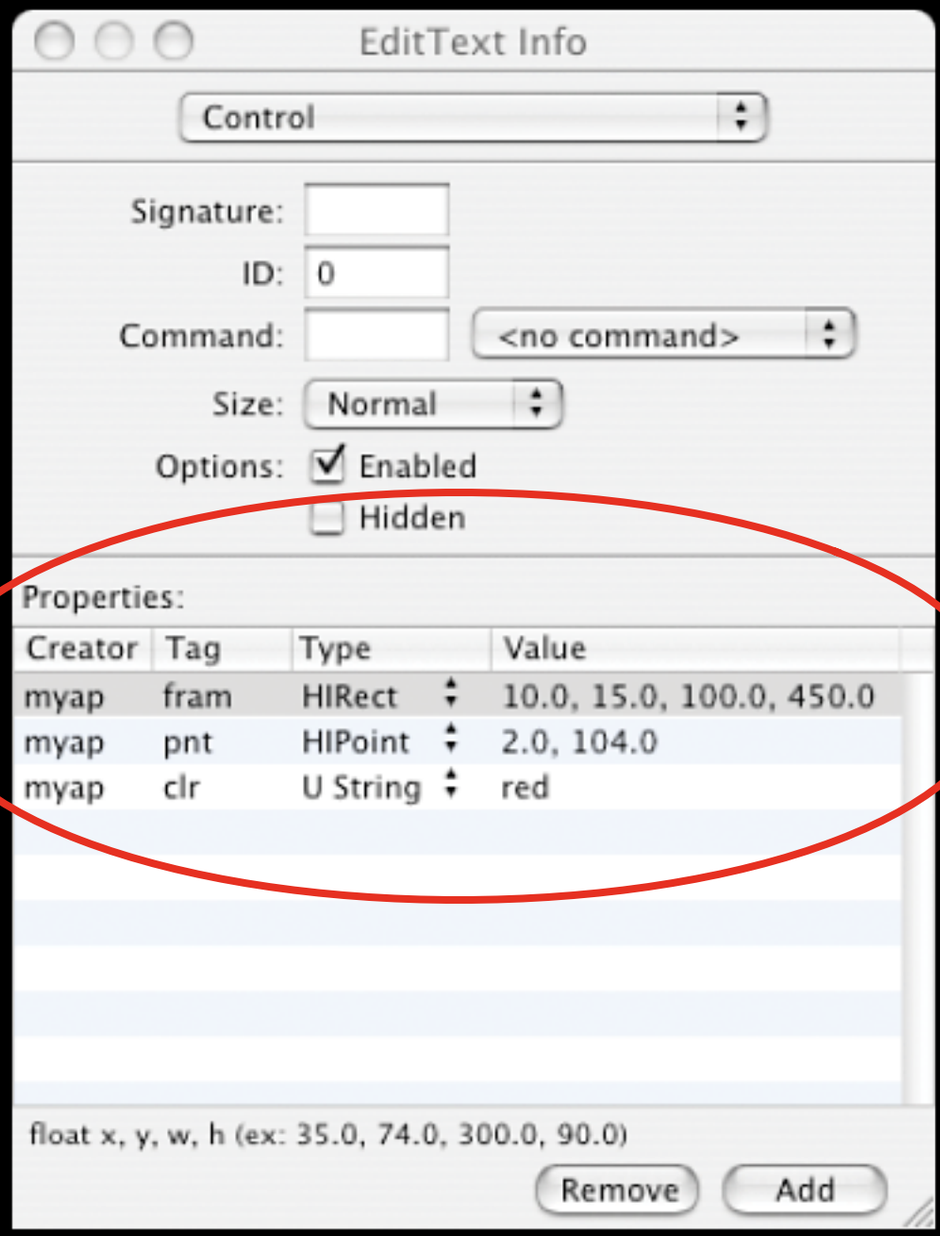
New for Carbon

- New supported Controls
  - HIImageView
  - HISearchField
  - HIScrollView
  - HITextView
- Mini Controls



New for Carbon

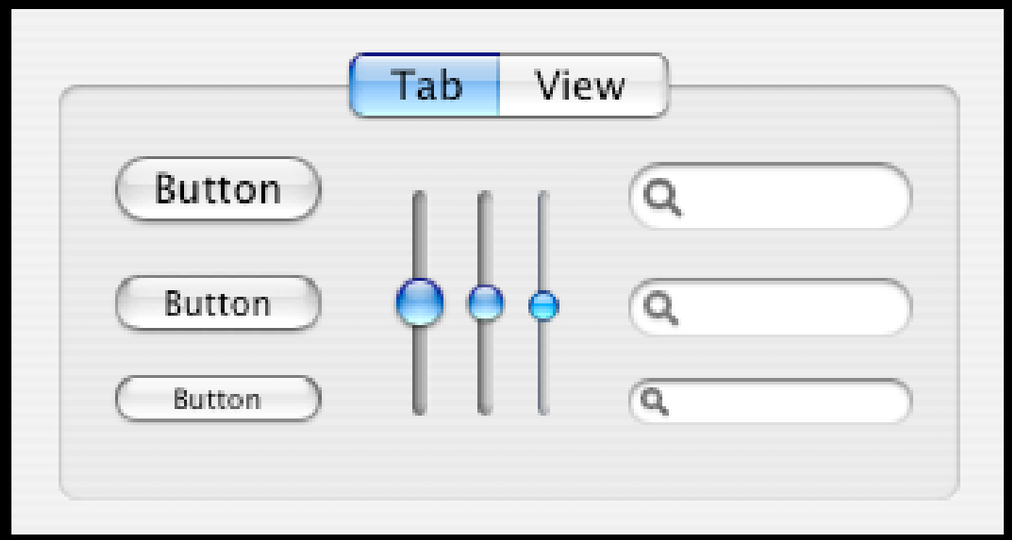
- New supported Controls
  - HIImageView
  - HISearchField
  - HIScrollView
  - HITextView
- Mini Controls
- Control Properties



Demo

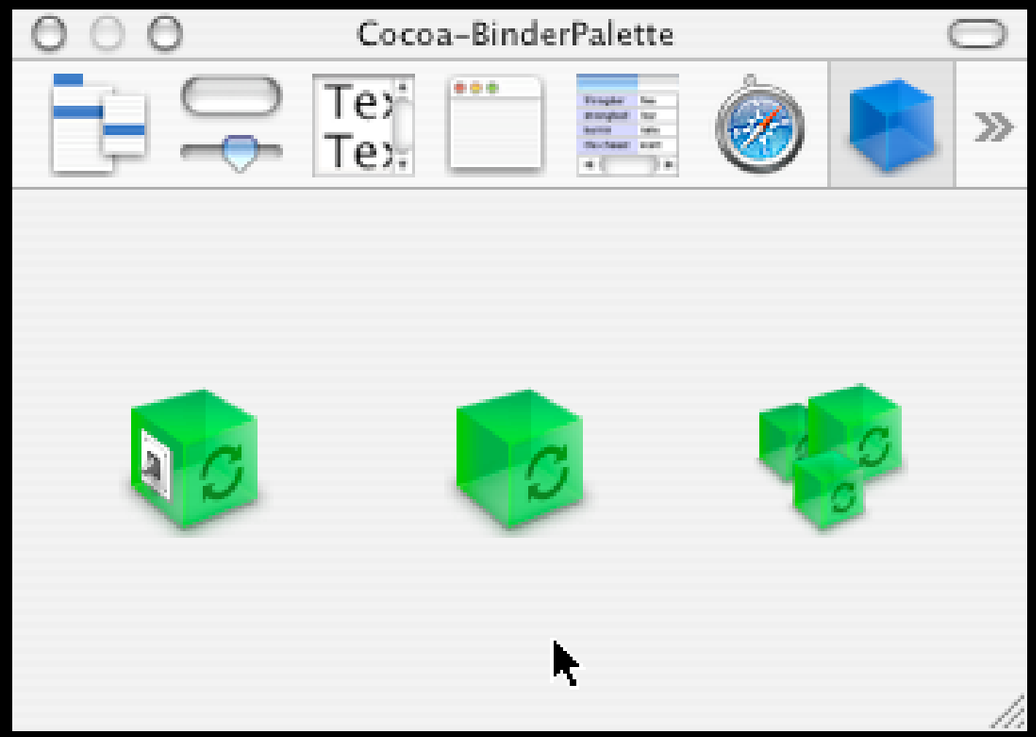
New for Cocoa

- Panther controls and sizes



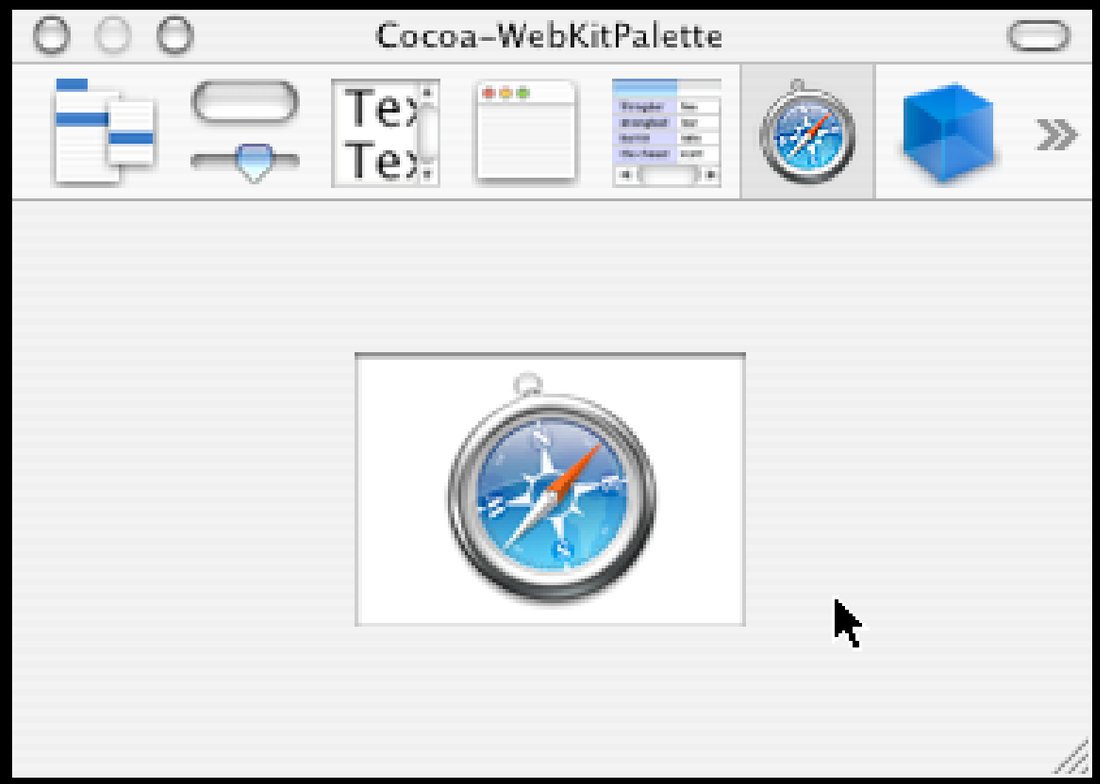
New for Cocoa

- Panther controls and sizes
- Controller Layer Support



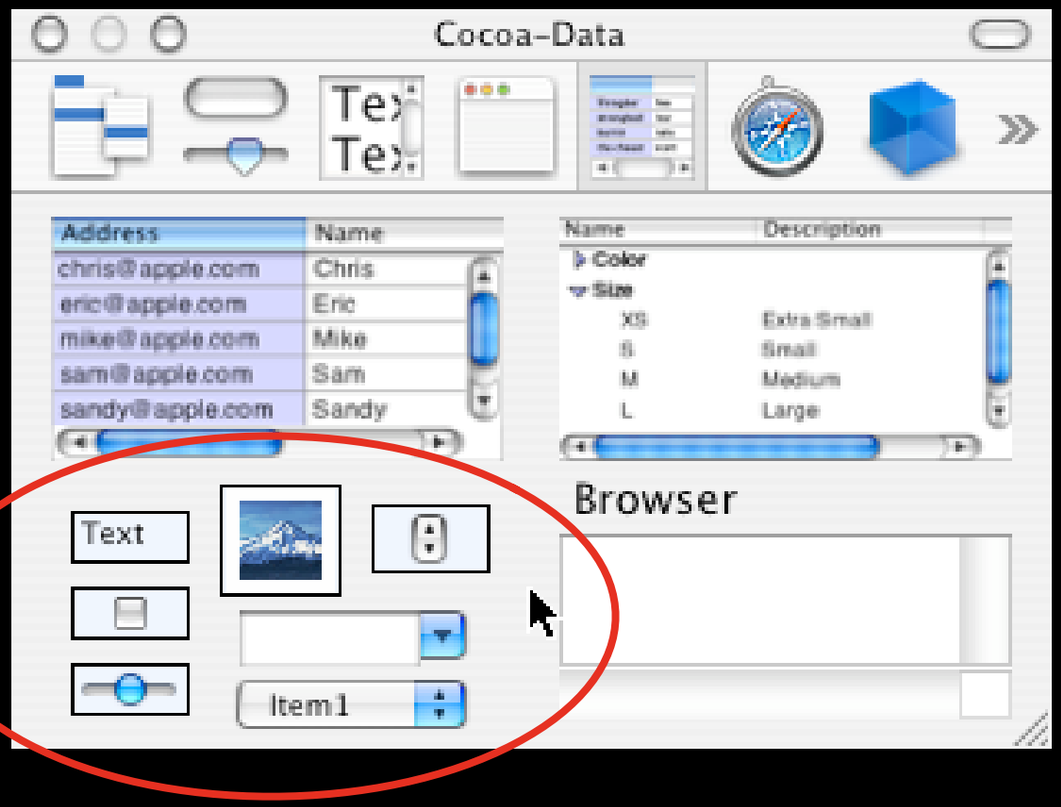
New for Cocoa

- Panther controls and sizes
- Controller Layer Support
- WebKit palette



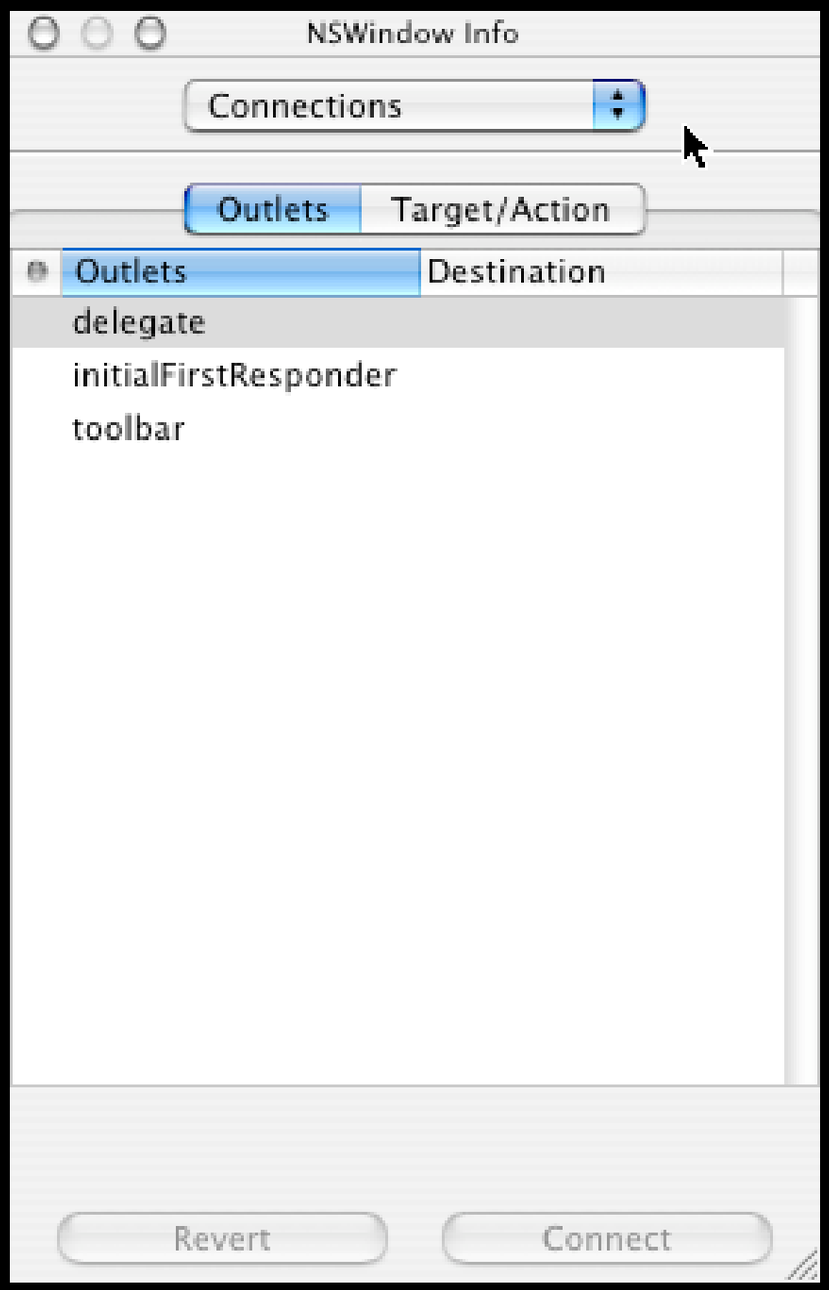
New for Cocoa

- Panther controls and sizes
- Controller Layer Support
- WebKit palette
- NSTableColumn dataCells



New for Cocoa

- Panther controls and sizes
- Controller Layer Support
- WebKit palette
- NSTableColumn dataCells
- Connections inspector



Demo

Compatibility Checking

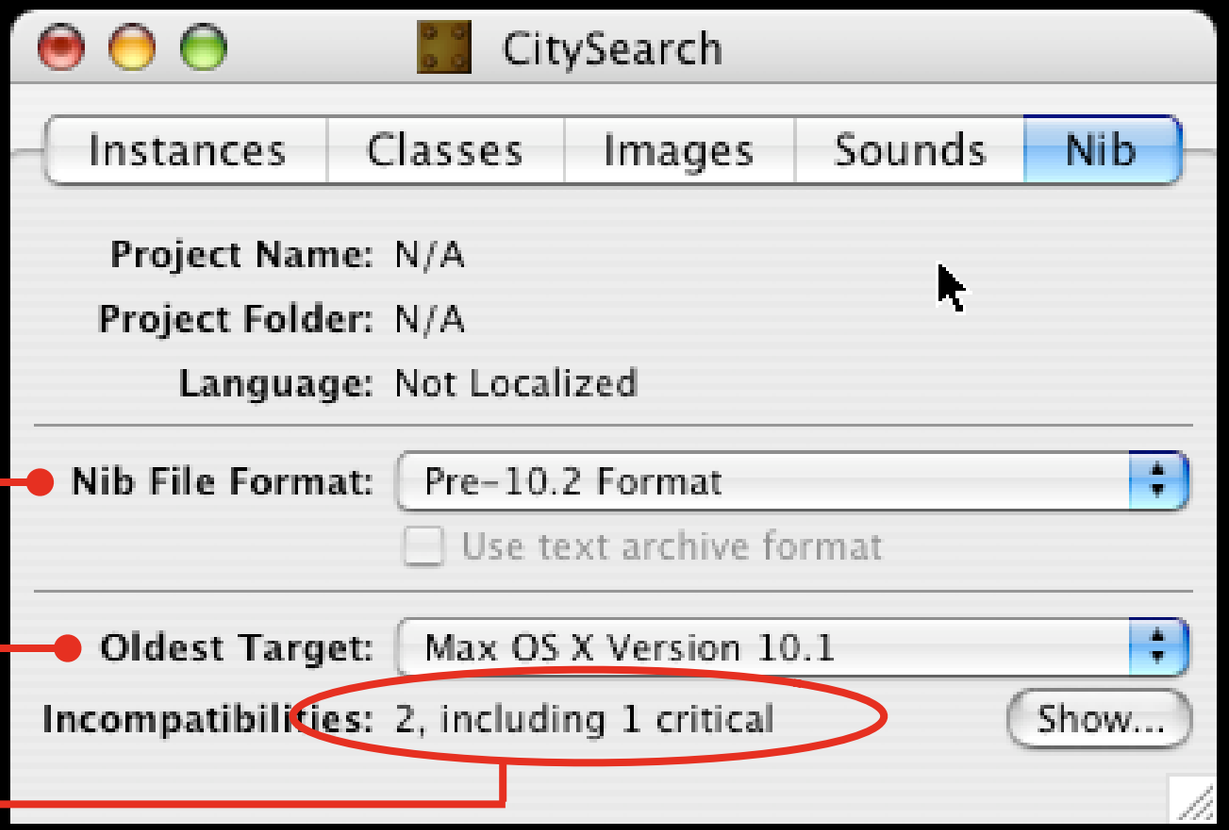
Improved

Compatibility Checking

Ensures Mac OS X version compatibility

Improved

1. Select nib format
2. Select oldest target
3. Watch for incompatibilities



Wrap Up

Summary

- Efficient workflow
- Fast
  - Building
  - Debugging
  - Profiling
- Use it!
  - Install on Jaguar and Panther
  - Send us feedback!

Who to Contact

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ramarren@apple.com

Mailing Lists at Apple

http://lists.apple.com

Development Tools Engineering Feedback

xcode-feedback@group.apple.com

http://developer.apple.com/wwdc2003/urls.html

For More Information

Reference Library

Documentation

Development Tools Overview (WWDC-only distribution)
ADC Member Site > Download Software >

Developer Tools What's New
ADC Home > Documentation > Developer Tools >

Xcode Release Notes
ADC Home > Documentation > ReleaseNotes >

Roadmap

303 Increasing Productivity With Xcode Learn techniques to get the most from Xcode	**The Presidio** **Wed., 2:00pm**
304 GCC In Depth Hear how the GCC compiler is being advanced	**The Mission** **Wed., 3:30pm**
305 Tuning With Performance Tools Get the most from your applications	**The Presidio** **Wed., 5:00pm**
307 Xcode for Carbon Development Find out how well Xcode works with Carbon projects	**Russian Hill** **Thurs., 9:00am**
FF009 Dev Tools Feedback Forum Give us your feedback on tools from Apple	**North Beach** **Thurs., 2:00pm**
308 Debugging on Mac OS X Learn all about Mac OS X's debugging services	**The Presidio** **Thurs., 3:30pm**

Q&A

Godfrey DiGiorgi
Technology Manager, Development Tools
ramarren@apple.com

http://developer.apple.com/wwdc2003/urls.html

WWDC 2003

Worldwide Developers Conference